Third Semester M.Tech. Degree Examination, May/June 2010
Design of Suspension Systems

Time: 3 hrs.

Max. Marks:100

Note : *Answer any FIVE full questions.*

1 a. Describe various damper mounting methods. **(10 Marks)**
   b. What are the ideal requirements of automotive suspension systems? **(05 Marks)**
   c. Explain drop test for estimation of suspension bump velocity. **(05 Marks)**

2 a. Explain the phenomenon of cavitation as applied to pressurized single tube and double-tube dampers. **(10 Marks)**
   b. Explain the effects of compressibility in automotive dampers. **(10 Marks)**

3 a. Explain the features of functional specifications of automotive dampers. **(10 Marks)**
   b. Describe MR fluid semi-active damper. **(05 Marks)**
   c. What are the advantages of semi-active dampers? **(05 Marks)**

4 a. Explain the steps involved in sinusoidal testing of automotive dampers. **(15 Marks)**
   b. What are the advantages and limitations of hydraulic testers for damper testing? **(05 Marks)**

5 a. Enumerate the sources of time delays in mechanical systems. **(04 Marks)**
   b. Explain the delay resonator based on the classical vibration absorber. **(06 Marks)**
   c. Explain how will you mathematically model linear dynamic system with delayed feedback. **(10 Marks)**

6 a. Explain the Lyapunov-Kasovaskii stability theorem. **(06 Marks)**
   b. Explain the stability analysis of delay independent single degree of freedom system. **(14 Marks)**

7 a. Explain the stability analysis of an automobile having four wheel steering with a time delay in driver's response. **(16 Marks)**
   b. Enumerate the effects of short time delays on the dynamics of controlled mechanical systems. **(04 Marks)**

8 a. Explain the term 'center manifold reduction'. **(06 Marks)**
   b. Explain the procedure for computing of the approximated center manifold. **(14 Marks)**